

BARTON HIGHWAY DUPLICATION

ECONOMIC EVALUATION REPORT

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Author:	Ariel Hersh
Project Manager:	Ariel Hersh
Project Director:	Tobias Martin
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Sinclair Knight Merz
100 Christie Street
St Leonards NSW 2065 Australia
PO Box 164 St Leonards NSW 2065 Australia
T +61 2 9928 2100
F +61 2 9928 2500
www.globalskm.com

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Executive summary

An economic evaluation of the proposed duplication of the Barton Highway between ACT border and the dual carriageways north of Murrumbateman has been undertaken to assess the viability of the project. The project's key economic objectives are to reduce congestion and improve safety. Roads and Maritime Services (Roads and Maritime), who is managing the planning process for the project, require an economic evaluation report to assist with future network planning and works priorities. The impact of the separate package of safety works for Barton Highway that has been ongoing since 2008 is assumed to have taken effect under the base case of this analysis as it is funded separately by the Australian Government.

The economic evaluation of the proposed duplication is carried out through a Cost-Benefit Analysis (CBA). The CBA compares the costs and benefits of the duplication with scenarios for the completion of construction in 5, 15 and 25 years. The CBA results, as provided in **Table 1-1**, show a Benefit Cost Ratio (BCR) of 0.45 for the constructing completing in 5 years. This means that for every dollar of investment, the project is estimated to return only 45 cents of benefits. Under all sensitivity tests, except for the 25 Year option with a 4% discount rate, the BCR remains lower than 1, which means that for every dollar of investment, the project is estimated to return less than 1 dollar of benefits. The scenario in which construction is completed in 25 years currently has a BCR of 0.71 based on the assumed traffic growth rate of 2%. This BCR may be refined as traffic forecasts for this period become more accurate. SKM therefore recommends that the case for this project be reviewed on a periodic basis by Roads and Maritime.

- Table 1-1 Key assumptions for the economic assessment

OPTION (7% Discount Rate)	2% Linear Growth - 5 Year	2% Linear Growth - 15 Year	2% Linear Growth - 25 Year
Present Value of Costs	\$ 739 m	\$ 395 m	\$ 211 m
Present Value of Benefits	\$ 335 m	\$ 228 m	\$ 150 m
BCR	0.45	0.58	0.71
NPV	-\$ 404 m	-\$ 167 m	-\$ 61 m

1. Introduction

Sinclair Knight Merz (SKM) was commissioned by the Roads and Maritime Services (Roads and Maritime) to undertake the economic assessment for the Barton Highway Duplication project.

The project involves the duplication of the existing single carriageway sections of the Barton Highway between the ACT border and the dual carriageways north of Murrumbateman. The project will address peak congestion and safety issues and cater for growth into the future. The impact of the separate package of safety works for Barton Highway¹ that has been ongoing since 2008 is assumed to have taken effect under the base case of this analysis as it is funded separately by the Australian Government.

Roads and Maritime, who is managing the planning process for the project, requires an economic evaluation report to assist with future network planning and works priorities. The economic assessment is being carried out at the strategic design stage to inform Roads and Maritime of the viability of the project in the short, medium and long term. The assessment uses high level concept design and traffic modelling, which is considered appropriate at this strategic stage of planning.

The purpose of the Economic Evaluation Report is to quantify the project's economic viability through a CBA framework. CBA is a tool for assessing the net benefits accruing to society as a whole as a result of a project, programme or policy. CBA enables decision makers to compare the relative merit of different (or alternative) programmes or projects in terms of their returns on the use of public resources.

The project's net benefit is evaluated based on construction being completed in 5, 15 and 25 years time and is assessed based on a base traffic growth scenario (2% linear traffic growth) and high growth scenario (3% linear traffic growth).

1.1 Structure of the Report

The remainder of this report is structured as follows:

- Chapter 2 outlines the guidelines used and the key assumptions adopted by the methodology.
- Chapter 3 details the inputs used in the assessment including the capital and operational cost, traffic and crash inputs.
- Chapter 4 presents the assessment of the initiative using a CBA framework.
- Chapter 5 summarises the results and provides some concluding remarks.

¹ http://www.rms.nsw.gov.au/roadprojects/projects/south_western_region/barton_highway/safety_works.html

2. Methodology

2.1 Economic Assessment

The economic analysis has been developed in accordance with the Principles and Guidelines for Economic Appraisal of Transport Initiatives (TfNSW, 2013) and the RTA Economic Analysis Manual (RTA, 1999). It has also been assumed that the capital estimates, provided by Roads and Maritime, have been prepared in accordance with the RTA Project Estimating Manual (RTA, 2006).

The evaluation utilises a standard assessment methodology based on the estimated change in traffic demand and performance. Traffic demands are based on high level traffic modelling undertaken by SKM, with the approach used outlined in **Section 2.2**. Capital cost estimates have been provided to SKM by Roads and Maritime². The appraisal quantifies project impacts which are incremental to the 'Do Nothing' over a 52 year evaluation period (3 years of construction and 27 years of post-construction operations including options with the 25 year construction option resulting in a 52 year evaluation period). The key assumptions and benefits and costs to be evaluated are listed in **Table 2-1**. All monetary values have been indexed to 2013/14 dollars unless otherwise stated.

- Table 2-1 Key assumptions for the economic assessment

Key assumptions	Benefits	Costs	Escalation
<ul style="list-style-type: none"> Evaluation Period: 52 years (3 years of construction and 27 years of post-construction operations for each construction option, with the 25 year construction option resulting in a 52 year evaluation period) Base Year: All monetary values have been indexed to 2013/14 dollars unless otherwise stated Discount Rate: a real discount rate of 7.0% has been used (with testing at 4% and 10%) Vehicle Classes Included: Light vehicles and heavy vehicles have been evaluated separately 	<ul style="list-style-type: none"> Travel time savings Vehicle operating cost savings Environmental cost savings Crash cost avoided 	<ul style="list-style-type: none"> Capital cost Operational cost 	<ul style="list-style-type: none"> Economic analysis is based on 2013/14 real dollars Historical escalation, sourced from Australian Bureau of Statistics (ABS), used to bring historical estimates into 2013/14 dollars Real escalation in construction and wage prices above CPI have been included using the following growth rates: <ul style="list-style-type: none"> - CPI growth at 2.5% per annum based on RBA target rate - Building Price Index at 3% per annum - Labour Price Index at 3.5% per annum

The project's net benefit is assessed based on construction being completed in 5, 15 and 25 years and is assessed based on a base traffic growth scenario (2% linear traffic growth) and high growth scenario (3% linear traffic growth).

² Concurrence Report, 7/8/12, Roads and Maritime

The key outputs of the assessment are key decision criteria including the Net Present Value (NPV) and Benefit Cost Ratio (BCR). The NPV represents the net economic value of the project based on a Discount Cashflow Analysis (DCA). A positive NPV suggests that the project's benefit is greater than the project's cost and therefore it is an economically viable project. The BCR represents the net benefit generated from each dollar of investment. A BCR of one suggests that every dollar of investment results in one dollar of benefit to the community.

The economic impacts of transport infrastructure provision can be derived by a number of alternative analytical techniques depending on the type of appraisal. The following impacts are quantified within the appraisal:

- Project Costs:
 - Capital expenditure
 - Operating and maintenance expenditure
- Project Benefits:
 - Travel time benefits
 - Vehicle operating cost benefits
 - Externality cost reductions
 - Crash cost reductions

The project benefits are estimated as follows:

- Travel time benefits are equal to the change in Vehicle Hours Travelled (VHT) multiplied by the Value of Time (VoT) taking into account the number of passengers and value of freight of different vehicle types.
- Vehicle operating cost benefits are equal to the change in Vehicle Kilometres Travelled (VKT) multiplied by Vehicle Operating Cost (VOC) rates.
- Externality cost reductions are equal to the change in VKT multiplied by the externality cost rates.
- Crash cost reductions are equal to the change in crash occurrences multiplied by the crash costs.

2.2 Traffic Analysis

The traffic analysis utilises a 'high-level' assessment methodology for the strategic assessment. The traffic analysis is based on traffic survey data, provided to SKM by Roads and Maritime, and Austroads' NAASRA Improved Model for Project Assessment and Costing (NIMPAC) model³. For the best estimate analysis, the traffic parameters are produced for four scenarios for two forecast years.

- Base case 'do nothing', assuming an annual linear growth rate of 2 per cent (years 2013 and 2043)
- Base case 'do nothing', assuming an annual linear growth rate of 3 per cent (years 2013 and 2043)
- With duplication, assuming an annual linear growth rate of 2 per cent (years 2013 and 2043)
- With duplication, assuming an annual linear growth rate of 3 per cent (years 2013 and 2043)

To account for the uncertainty associated with the project vehicle speed and annual freight growth, the four sets of traffic parameters produced for the best estimate are also produced for the following key variable adjustments:

- Maximum vehicle speed in the project case increased from 100km/h to 110km/h
- Increase annual freight linear growth rate to 4%, based on data from Bureau of Freight Statistics
- Increase annual freight linear growth rate to 5%, based on data from Bureau of Freight Statistics

The following qualifications of the traffic results should be considered:

³ Values used were based on Austroads' *Economic Evaluation of Road Investment Proposals, 2005*

- While two forecast years is considered appropriate for this strategic level assessment, a more accurate assessment would require a larger number of forecast years.
- As the traffic forecasts are based on assumed traffic growth rates applied to the current volumes, the traffic forecasts become less reliable each year into the future. In the long term, it is difficult to predict the impact of external factors, such as land use, on annual traffic growth.

The methodology and source data used for calculating each parameter is outlined in the **Table 2-2**:

- Table 2-2 Traffic Analysis Methodology and Source Data

Parameter	Methodology and source data
AADT for light and heavy vehicles	<ul style="list-style-type: none"> • Based on August 2012⁴ traffic survey data provided by Roads and Maritime at five points along the highway. The existing AADT values calculated using peak survey data is provided in Appendix A.
Total vehicle kilometres travelled for light and heavy vehicles	<ul style="list-style-type: none"> • AADT multiplied by length of road.
Average speed for light and heavy vehicles (base case)	<ul style="list-style-type: none"> • A combination of the 'as built' design drawings provided by Roads and Maritime and the <i>NIMPAC</i> model as described in Austroads' <i>Economic Evaluation of Road Investment Proposals</i> is used to calculate the average speed along the length of the duplicated highway. • The best estimate assumes a maximum speed of 100km/h based on the current signage on the road
Average speed for light and heavy vehicles (with duplication)	<ul style="list-style-type: none"> • A combination of the design drawings provided by Roads and Maritime and the <i>NIMPAC</i> model as described in Austroads' <i>Economic Evaluation of Road Investment Proposals</i> is used to calculate the average speed along the length of the duplicated highway. • Maximum speed is assumed to be 100km/h based on the current signage on the road • It is assumed that any improvement in pavement quality of road as part of the duplication project would not result in a material increase in vehicle speeds
Total travel time for light and heavy vehicles (base case)	<ul style="list-style-type: none"> • Kilometres travelled divided by average speed (calculated using the Austroads <i>NIMPAC</i> model). • The time calculated by a navigational tool, for example Google Maps or Sensis, is used to sense check the results calculated by the Austroads <i>NIMPAC</i> model.
Total travel time for light and heavy vehicles (with duplication)	<ul style="list-style-type: none"> • Kilometres travelled divided by average speed (calculated using the Austroads <i>NIMPAC</i> model).

2.3 Sensitivity Analysis

The assumptions used in the appraisal have been derived from the *Principles and Guidelines for Economic Appraisal of Transport Initiatives (TfNSW, 2013)*. They are widely accepted to be the best estimate of the subject parameters, therefore its application forms the 'Best Estimate' or most likely project outcome. To test the sensitivity of the best estimate, key assumptions are varied one at a time, to understand their impact and influence on the NPV and BCR. The sensitivity tests have been outlined in **Table 2-3**.

⁴ The base year of the traffic modelling is the 2013 financial year based on the survey occurring in this year

- Table 2-3 Summary of sensitivity tests

Sensitivity Test No.	Description
0	Best estimate (discount rate of 7%)
1	Decrease real discount rate to 4%
2	Increase real discount rate to 10%
3	Increase Capital Costs by 15%
4	Decrease Capital Costs by 15%
5	Increase Operating and Maintenance Costs by 15%
6	Decrease Operating and Maintenance Costs by 15%
7	Increase VoT Benefits by 15%
8	Decrease VoT Benefits by 15%
9	Increase VOC Benefits by 15%
10	Decrease VOC Benefits by 15%
11	Increase Safety Benefits by 15%
12	Decrease Safety Benefits by 15%
13	No Increase for Labour Price Index (LPI)
14	No Increase for Building Price Index (BPI)
15	Best estimate (Traffic Growth Rate of 2%)
16	Traffic (Car and Freight) Growth Rate of 3%
17	Freight Growth Rate of 4%
18	Freight Growth Rate of 5%
19	Project Max Speed of 110km/h

3. Inputs

3.1 Capital cost inputs

Capital cost estimates used in the appraisal are defined as the incremental costs incurred by constructing and delivering the infrastructure required for the duplication. The capital cost estimates have been provided by Roads and Maritime and were developed based on the concept design. The total capital costs reported in the PMO Concurrence Report (April 2012) is \$880.0 million (excluding GST) which is made up of \$598.0 million in base cost and \$282.0 million in contingency (47% of total reported cost). The capital costs in 2013/14 dollars is \$906.4 million, which is the figure used in the analysis.

3.2 Capital cost schedule

The three construction options assessed in the model have different construction completion dates. The construction and operating dates for each option are outlined in **Table 3-1**. The real construction costs are increased by the real BPI increases.

- Table 3-1 Schedule of capital cost

Years Until Construction Complete	Construction Start	Construction Finish	Operating Start	Operating Finish
5 Years	2016	2018	2019	2035
15 Years	2026	2028	2029	2045
25 Years	2036	2038	2039	2055

Since the timings of cashflows are yet to be determined, the cost incurred per year is assumed to be described by a standard S curve for a construction period of three years, which is given in **Table 3-2**.

- Table 3-2 Summary of capital cost

	Year 1	Year 2	Year 3
Proportion	24.6%	51.8%	23.6%
Capital Cost	\$ 222.97 m	\$ 469.52 m	\$ 213.91 m

3.3 Operational and Maintenance cost inputs

The operating and maintenance cost estimates used in this evaluation are the incremental costs incurred in operating and maintaining the road. The base case operating and maintenance costs are based on the average 10 year historical maintenance costs, with adjustments made for CPI. The project operating and maintenance costs are based on per kilometre and per lane kilometre maintenance costs provided by Roads and Maritime. The incremental operating and maintenance cost is calculated as \$ -1,460,028/ per annum.

3.4 Traffic inputs

Traffic demand forecasts are determined as outlined in **Section 2.2**. The modelled outputs, Vehicle Kilometres Travelled (VKT) and Vehicle Hours Travelled (VHT) are common statistics used to measure network performance. Since the model was only developed for the one hour AM peak and PM peak for 2013 and 2043 years, expansion factors were applied to extrapolate the results to calculate annual values. As the highway is considered rural an expansion factor of 12.1 for the PM peak only⁵ is used to convert the one hour peak to weekday values and an expansion factor of 347 is used to annualise the results. Refer to Appendix B, Appendix C and Appendix D and Appendix E for the traffic data used in the assessment.

⁵ Alternatively, if the road is considered urban and the AM peak only is used the impact on the NPV is less than 2%.

The project results in a substantial increase in speed as can be seen in Table 3-3, which results in an average reduction in travel time per vehicle of 8 minutes for cars and 6 minutes for freight.

- Table 3-3 Vehicle Speeds for Best Estimate Traffic Parameters

	Base Case - 2% Growth		Base Case - 3% Growth		Project Case - 2% Growth		Project Case - 3% Growth	
	2013	2043	2013	2043	2013	2043	2013	2043
Average speed [km/h], Vehicle Class Car	73	65	73	65	100	93	100	89
Average speed [km/h], Vehicle Class HGV	67	63	67	63	85	82	85	80

3.5 Crash Inputs

The economic analysis of crash benefits is based on historical crash rates and the reduction in crashes that are expected to occur in the project case. The historical crash rates are based on crash statistics over 5 years, from July 2007 to June 2012. The crashes that occurred in the project corridor but are in the area of the program of safety works⁶ are excluded from the analysis of crash benefits, as the impacts are assumed to have taken effect under the base case with no further benefits expected under the project case. The list of historical crashes and the identification of those crashes in the area of the program of safety works and therefore excluded from the analysis is provided in **Appendix F**.

From the complete dataset crashes are summarised into the crash type as outlined in **Table 3-4**.

- Table 3-4 Crashes in the Project Corridor

Crash type	Fatalities occurred	Persons injured	Crashes with property only damage
Off road ⁷	2	22	24
Rear-end	1	12	10
Hit animal	-	3	9
Overtake; same direction	-	2	-
Head-On	1	16	2
Manoeuvring	-	-	1

The estimated crash reduction is based on an assessment of how the project may reduce crashes due to implementation of known crash countermeasure treatments. The duplication is the only countermeasure which will improve safety in the study area. **Table 3-5** provides a description of the impact of duplication on relevant crashes by crash type as provided in Accident Reduction Guide, RTA, 2004.

- Table 3-5 Description of countermeasures

	Head-On	Manoeuvring or Overtake	Rear-end	Hit Parked Vehicle	Off Road	Hit Animal
Duplication	100%	50%	30%	10%	15%	0%

Crash statistics over the last five years can be monetised by applying the following average crash cost, as provided by TfNSW Principles and Guidelines for Economic Appraisal of Transport Initiatives:

- Per fatality at \$6,215,893

⁶ http://www.rms.nsw.gov.au/roadprojects/projects/south_western_region/barton_highway/safety_works.html

⁷ Off road crashes includes off straight and off curve

- Per injury at \$266,141
- Per property damage only crash at \$8,396

4. Assessment

4.1 Travel time benefits

Travel time cost represents the cost perceived by road users when making transport choices. Improved traffic flows typically reduce journey times, which results in less network congestion and enhanced network reliability.

The benefits associated with travel time are estimated by the difference between the travel time cost under the Base Case and Project Case scenarios. Total travel time benefits are estimated by the formula given below aggregated across all vehicle types.

$$\text{Travel time savings} = (VHT_{\text{Base Case}} \times \text{VoT}) - (VHT_{\text{Project Case}} \times \text{VoT})$$

- Where:

- VHT = Vehicle Hours Travelled
- VoT = Value of Time

The value of times applied are outlined in **Table 4-1**.

The value of time has been sourced from the TfNSW Principles and Guidelines for Economic Appraisal of Transport Initiatives and indexed by Average Weekly Earnings to reflect the price year of the assessment. The weightings of different vehicle types are based on Survey of Motor Vehicle Use, ABS, 2012.

- Table 4-1 Value of travel time (2013/14 prices)

Vehicle Type ⁸	Value of Travel Time \$ per vehicle-hour	Comment
Light Vehicle (LV)	\$33.42	Based on a weighted average of the following: <ul style="list-style-type: none"> Car private vehicles (61% of total LV) at \$24.97 per vehicle-hour Car business trips (18% of total LV) at \$61.10 per vehicle-hour LCV (21% of total LV) at \$34.57 per vehicle-hour
Heavy Vehicles (HV)	\$47.28	Based on an average occupancy of 1 person per vehicle at a value of \$27.78 per person-hour and freight at \$23.53 per vehicle-hour.

The total value and present value of travel time savings are provided in **Table 4-2** and **Table 4-3** respectively. The results show that the light vehicles benefits make up a large proportion of total travel time benefits. The total value (not discounted) of the benefits pertaining to the construction completion in 25 years scenario is approximately 70% greater than the in the construction complete in 5 years scenario. When the future benefits of all options are discounted the 5 years scenario is greater than the 25 years scenario.

- Table 4-2 Summary of travel time benefits (\$m) – Total value in 2014 real dollars

	5 Years Until Construction Complete	15 Years Until Construction Complete	25 Years Until Construction Complete
LV	\$ 780.6 m	\$ 1,036.1 m	\$ 1,335.6 m
HV	\$ 110.0 m	\$ 130.8 m	\$ 151.6 m
Total	\$ 890.6 m	\$ 1,166.9 m	\$ 1,487.1 m

⁸ Benefits resulting from reduction in travel time for buses have not been included due to the very low number of buses traveling in the project area.

- Table 4-3 Summary of travel time benefits (\$m) – Present value in 2014 real dollars

7% discount rate	5 Years Until Construction Complete	15 Years Until Construction Complete	25 Years Until Construction Complete
LV	\$ 233.8 m	\$ 160.1 m	\$ 89.2 m
HV	\$ 34.5 m	\$ 21.1 m	\$ 10.8 m
Total	\$ 268.3 m	\$ 181.3 m	\$ 100.0 m

4.2 Vehicle operating cost benefits

Vehicle Operating Cost (VOC) unit estimates are based on the VOC per vehicle kilometre as defined for rural projects in Appendix 4, Tables 22 to 30 in the TfNSW Principles and Guidelines for Economic Appraisal of Transport Initiatives. The VOC unit estimates vary based on different vehicle types, speed, road types and road conditions.

The total value and present value of VOC savings are provided in **Table 4-4**. The increase in vehicle speed and the improvement in road conditions result in a reduction in the per kilometre VOC in the project case. While the total vehicle kilometres increase in the project case, the more significant reduction in the per kilometre VOC drives an overall VOC benefit in the project case. When compared with the overall benefit stream the vehicle operating costs comprise approximately 10% of total project benefits.

- Table 4-4 Vehicle Operating Benefits (\$m) – Present Value in 2014 real dollars

7% discount rate	5 Years Until Construction Complete	15 Years Until Construction Complete	25 Years Until Construction Complete
LV	\$ 16.72 m	\$ 15.62 m	\$ 10.09 m
HV	\$ 18.40 m	\$ 12.62 m	\$ 7.02 m
Total	\$ 35.12 m	\$ 28.24 m	\$ 17.11 m

4.3 Externality cost savings

Externality cost represents the cost to society associated with the environmental impact of road traffic. The benefits associated with externalities are estimated by the difference between the externality cost under the Base Case and Project Case scenarios. Total externality benefits are estimated by the formula given below aggregated across all vehicle types.

$$\text{Externality Cost Savings} = (VKT_{\text{Base Case}} \times EC) - (VKT_{\text{Project Case}} \times EC)$$

- Where:

- VKT = Vehicle Kilometres Travelled
- EC = Total Environmental Costs per Kilometre

Total Environmental Costs per Kilometre is the summation of the environmental unit estimates provided by TfNSW Principles and Guidelines for Economic Appraisal of Transport Initiatives. The rural unit costs are documented in **Table 4-5**.

- Table 4-5 Externality Unit Costs (\$2013/14 per VKT)

Type	Passenger Vehicles	Freight (\$/1000 tonne-km)	
	Cents per VKT	Light Vehicle	Heavy
Noise	-	-	0.42
Air Pollution	0.03	-	0.25
Water Pollution	0.04	0.28	1.50
Greenhouse	2.37	58.54	5.58
Nature and Landscape	0.55	0.22	4.19
Urban Separation	-	-	-
Upstream & Downstream costs	4.05	195.12	22.31
Total	7.05	254.16	34.25

Table 4-6 shows the externality costs by environmental type and vehicle type as a result of the project options. As the externality benefit are based on a per kilometre cost and the total vehicle distance travelled increases in the project case, the duplication will result in small negative externality benefits.

- Table 4-6 Total Externality Benefits (\$m) – Present Value in 2014 real dollars

7% discount rate	5 Years Until Construction Complete	15 Years Until Construction Complete	25 Years Until Construction Complete
LV	-\$ 2.05 m	-\$ 1.20 m	-\$ 0.69 m
HV	-\$ 1.79 m	-\$ 1.05 m	-\$ 0.60 m
Total	-\$ 3.84 m	-\$ 2.25 m	-\$ 1.30 m

4.4 Crash cost avoided

Crash cost avoided represents the change in monetised crashes, moving from the Base Case to the Project Case. Project Case crash cost per year is calculated by reducing the Base Case crashes for crashes in the proposed corridor of the duplication, while excluding any crashes relating to the safety works program, using the countermeasures outlined in **Table 3-5** above. The base and project case crash rates are assumed to increase into the future at the same rate as VKT increases.

Table 4-7 shows the crash cost avoided as a result of the project case.

- Table 4-7 Crash Cost (\$m) – Current Crash Rate

	Base Case	Project Case
Annual Crash Cost at Current Rate	\$7,977,505	\$4,885,870

5. Results and Conclusion

The CBA results show a BCR of 0.45 for construction completing in 5 years. This means that for every dollar of investment, the project is estimated to return 45 cents of benefits. In the case that the project is delayed so completion of construction would occur in 25 years results in a higher BCR of 0.71. The summary of results is provided in **Table 5-1**.

■ Table 5-1 Summary of results

OPTION (7% Discount Rate)	2% Growth - 5 Years until project completion	2% Growth - 15 Years until project completion	2% Growth - 25 Years until project completion
Costs			
Capital Costs	\$ 752 m	\$ 401 m	\$ 214 m
Maintenance Costs	-\$ 13 m	-\$ 7 m	-\$ 3 m
Total Costs	\$ 739 m	\$ 395 m	\$ 211 m
Benefits			
Travel Time Savings	\$ 268 m	\$ 181 m	\$ 119 m
VOC Savings	\$ 35 m	\$ 28 m	\$ 21 m
Externality Savings	-\$ 4 m	-\$ 2 m	-\$ 1 m
Safety Savings	\$ 35 m	\$ 21 m	\$ 12 m
Total Benefits	\$ 335 m	\$ 228 m	\$ 150 m
BCR	0.45	0.58	0.71
NPV	-\$ 404 m	-\$ 167 m	-\$ 61 m

The key findings from the CBA are as follows:

- In all construction timing options the BCR is lower than 1 which means that for every dollar of investment, the project design is estimated to return less than 1 dollar of benefits.
- The scenarios that have construction being completed in 15 and 25 years are expected to return higher BCRs than the scenario in which construction is completed in 5 years.
- The benefits are primarily driven by the travel time savings attributed to light vehicles.
- Externality savings are negative as the project results in an increase in vehicle kilometres travelled resulting in an increase in externality costs.
- Reduction in crash costs as a result of the duplication contributes a small proportion of benefits as compared to the net benefits.

5.1 Sensitivity Analysis

Sensitivity testing is a relatively simple way to assess the uncertainty around the assessment results. The procedure adopted involves three steps:

- Re-run the CBA with different data – i.e. conduct sensitivity analysis.
- Identify the critical project inputs.
- Interpret the results – i.e. assess how variables tested impact the ranking of the options.

In order to re-run the initial CBA, the sensitivity analysis involves a change in one input variable at a time to observe the resultant change in the BCR or NPV.

The variables tested for sensitivity include:

- Discount rate
- Capital expenditure
- Operating and maintenance expenditure
- Change in VKT and VHT benefits
- Change in Safety Benefits
- Construction price growth
- Wage price growth
- Traffic (car and freight) growth rate
- Freight growth rate
- Maximum speed in the project case

The following sensitivity parameters are adopted as shown **Table 5-2**.

■ Table 5-2 Sensitivity Analysis Results

Sensitivity Test No.	Description	5 Years until project completion		15 Years until project completion		25 Years until project completion	
		NPV	BCR	NPV	BCR	NPV	BCR
0	Best estimate (discount rate of 7%)	-\$ 404 m	0.45	-\$ 167 m	0.58	-\$ 61 m	0.71
1	Decrease real discount rate to 4%	-\$ 261 m	0.67	-\$ 84 m	0.85	\$ 17 m	1.04
2	Increase real discount rate to 10%	-\$ 463 m	0.32	-\$ 162 m	0.41	-\$ 55 m	0.51
3	Increase Capital Costs by 15%	-\$ 517 m	0.39	-\$ 227 m	0.50	-\$ 93 m	0.62
4	Decrease Capital Costs by 15%	-\$ 291 m	0.53	-\$ 107 m	0.68	-\$ 29 m	0.84
5	Increase Operating Costs by 15%	-\$ 402 m	0.45	-\$ 166 m	0.58	-\$ 60 m	0.71
6	Decrease Operating Costs by 15%	-\$ 406 m	0.45	-\$ 168 m	0.58	-\$ 61 m	0.71
7	Increase VoT Benefits by 15%	-\$ 364 m	0.51	-\$ 140 m	0.65	-\$ 43 m	0.80
8	Decrease VoT Benefits by 15%	-\$ 444 m	0.40	-\$ 194 m	0.51	-\$ 79 m	0.63
9	Increase VOC Benefits by 15%	-\$ 399 m	0.46	-\$ 163 m	0.59	-\$ 58 m	0.73
10	Decrease VOC Benefits by 15%	-\$ 409 m	0.45	-\$ 171 m	0.57	-\$ 64 m	0.70
11	Increase Safety Benefits by 15%	-\$ 399 m	0.46	-\$ 164 m	0.59	-\$ 59 m	0.72
12	Decrease Safety Benefits by 15%	-\$ 409 m	0.45	-\$ 170 m	0.57	-\$ 63 m	0.70
13	No Increase for LPI	-\$ 437 m	0.41	-\$ 202 m	0.49	-\$ 92 m	0.57
14	No Increase for BPI	-\$ 393 m	0.46	-\$ 142 m	0.62	-\$ 38 m	0.80
15	Best estimate (Traffic Growth Rate of 2%)	-\$ 404 m	0.45	-\$ 167 m	0.58	-\$ 61 m	0.71
16	Traffic (Car and Freight) Growth Rate of 3%	-\$ 374 m	0.49	-\$ 138 m	0.65	-\$ 38 m	0.82
17	Freight Growth Rate of 4%	-\$ 395 m	0.46	-\$ 159 m	0.60	-\$ 55 m	0.74
18	Freight Growth Rate of 5%	-\$ 391 m	0.47	-\$ 155 m	0.61	-\$ 52 m	0.75
19	Project Max Speed of 110km/h	-\$ 379 m	0.49	-\$ 150 m	0.62	-\$ 50 m	0.76

The key findings from the sensitivity analysis are as follows:

- Under all sensitivity tests the BCR for the 5 Year and 15 Year options is lower than 1 which means that for every dollar of investment, the project is estimated to return less than 1 dollar of benefits.
- Under all sensitivity tests, other than for a 4% discount rate, the 25 Year option has a BCR lower than 1
- The discount rate variable has the largest impact on the NPV and BCR.

Appendix A. AADT Traffic Inputs for the Best Estimate Base and Project Cases

	Base Case - 2% Growth		Base Case - 3% Growth		Project Case - 2% Growth		Project Case - 3% Growth	
	2013	2043	2013	2043	2013	2043	2013	2043
Number of vehicles that have left the network, Vehicle Class Car	10,884	17,415	10,884	20,680	10,884	17,415	10,884	20,680
Number of vehicles that have left the network, Vehicle Class HGV	1,660	2,656	1,660	3,154	1,660	2,656	1,660	3,154
Total Distance Travelled [km], Vehicle Class Car	350,478	560,765	350,478	665,909	357,009	571,215	357,009	678,317
Total Distance Travelled [km], Vehicle Class HGV	53,448	85,517	53,448	101,552	54,444	87,111	54,444	103,444
Total travel time [h], Vehicle Class Car	4,831	8,666	4,831	10,291	3,580	6,134	3,580	7,587
Total travel time [h], Vehicle Class HGV	797	1,361	797	1,616	638	1,061	638	1,290
Average speed [km/h], Vehicle Class Car	73	65	73	65	100	93	100	89
Average speed [km/h], Vehicle Class HGV	67	63	67	63	85	82	85	80

Appendix B. Peak Traffic Parameters for Best Estimate

Base Case	Annual Traffic Growth – 2%				Annual Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	807	900	1,292	1,439	807	900	1,534	1,709
Number of vehicles that have left the network, Vehicle Class HGV	125	137	199	219	125	137	237	261
Total Distance Travelled [km], Vehicle Class Car	25,993	28,965	41,590	46,344	25,993	28,965	49,388	55,034
Total Distance Travelled [km], Vehicle Class HGV	4,013	4,417	6,420	7,068	4,013	4,417	7,624	8,393
Total travel time [h], Vehicle Class Car	348	399	626	716	348	399	754	851
Total travel time [h], Vehicle Class HGV	59	66	101	112	59	66	121	134
Average speed [km/h], Vehicle Class Car	75	73	66	65	75	73	65	65
Average speed [km/h], Vehicle Class HGV	68	67	64	63	68	67	63	63

Project Case ⁹	Annual Traffic Growth – 2%				Annual Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	802	896	1,283	1,434	802	896	1,523	1,703
Number of vehicles that have left the network, Vehicle Class HGV	124	137	198	219	124	137	235	260
Total Distance Travelled [km], Vehicle Class Car	26,294	29,394	42,071	47,031	26,294	29,394	49,959	55,849
Total Distance Travelled [km], Vehicle Class HGV	4,063	4,489	6,500	7,182	4,063	4,489	7,719	8,529
Total travel time [h], Vehicle Class Car	263	295	446	505	263	295	548	625
Total travel time [h], Vehicle Class HGV	48	53	79	87	48	53	96	106
Average speed [km/h], Vehicle Class Car	100	100	94	93	100	100	91	89
Average speed [km/h], Vehicle Class HGV	85	85	82	82	85	85	81	80

⁹ The volume of vehicles is marginally different between the base and project options in the raw traffic results due modelling idiosyncrasies. The traffic parameters for the project case are adjusted at the AADT level to equalise the traffic volumes for the project case with the base case.

Appendix C. Peak Traffic Parameters for Max Speed of 110km/h

Base Case	Annual Traffic Growth – 2%				Annual Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	807	900	1,292	1,439	807	900	1,534	1,709
Number of vehicles that have left the network, Vehicle Class HGV	125	137	199	219	125	137	237	261
Total Distance Travelled [km], Vehicle Class Car	25,993	28,965	41,590	46,344	25,993	28,965	49,388	55,034
Total Distance Travelled [km], Vehicle Class HGV	4,013	4,417	6,420	7,068	4,013	4,417	7,624	8,393
Total travel time [h], Vehicle Class Car	348	399	626	716	348	399	754	851
Total travel time [h], Vehicle Class HGV	59	66	101	112	59	66	121	134
Average speed [km/h], Vehicle Class Car	75	73	66	65	75	73	65	65
Average speed [km/h], Vehicle Class HGV	68	67	64	63	68	67	63	63

Project Case ¹⁰	Annual Traffic Growth – 2%				Annual Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	802	896	1,283	1,434	802	896	1,523	1,703
Number of vehicles that have left the network, Vehicle Class HGV	124	137	198	219	124	137	235	260
Total Distance Travelled [km], Vehicle Class Car	26,294	29,394	42,071	47,031	26,294	29,394	49,959	55,849
Total Distance Travelled [km], Vehicle Class HGV	4,063	4,489	6,500	7,182	4,063	4,489	7,719	8,529
Total travel time [h], Vehicle Class Car	242	271	415	471	242	271	514	588
Total travel time [h], Vehicle Class HGV	48	52	79	87	48	52	95	106
Average speed [km/h], Vehicle Class Car	109	108	101	100	109	108	97	95
Average speed [km/h], Vehicle Class HGV	85	86	83	82	85	86	81	80

¹⁰ The volume of vehicles is marginally different between the base and project options in the raw traffic results due modelling idiosyncrasies. The traffic parameters for the project case are adjusted at the AADT level to equalise the traffic volumes for the project case with the base case.

Appendix D. Peak Traffic Parameters for Freight Growth of 4%

Base Case	Annual Car Traffic Growth – 2%				Annual Car Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	807	900	1,292	1,439	807	900	1,534	1,709
Number of vehicles that have left the network, Vehicle Class HGV	125	137	274	302	125	137	274	302
Total Distance Travelled [km], Vehicle Class Car	25,993	28,965	41,590	46,344	25,993	28,965	49,388	55,034
Total Distance Travelled [km], Vehicle Class HGV	4,013	4,417	8,828	9,718	4,013	4,417	8,828	9,718
Total travel time [h], Vehicle Class Car	348	399	631	716	348	399	758	851
Total travel time [h], Vehicle Class HGV	59	66	139	155	59	66	140	155
Average speed [km/h], Vehicle Class Car	75	73	66	65	75	73	65	65
Average speed [km/h], Vehicle Class HGV	68	67	63	63	68	67	63	63

Project Case ¹¹	Annual Car Traffic Growth – 2%				Annual Car Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	802	896	1,283	1,434	802	896	1,523	1,703
Number of vehicles that have left the network, Vehicle Class HGV	124	137	272	301	124	137	272	301
Total Distance Travelled [km], Vehicle Class Car	26,294	29,394	42,071	47,031	26,294	29,394	49,959	55,849
Total Distance Travelled [km], Vehicle Class HGV	4,063	4,489	8,938	9,875	4,063	4,489	8,938	9,875
Total travel time [h], Vehicle Class Car	263	295	454	516	263	295	554	632
Total travel time [h], Vehicle Class HGV	48	53	110	122	48	53	111	124
Average speed [km/h], Vehicle Class Car	100	100	93	91	100	100	90	88
Average speed [km/h], Vehicle Class HGV	85	85	81	81	85	85	80	80

¹¹ The volume of vehicles is marginally different between the base and project options in the raw traffic results due modelling idiosyncrasies. The traffic parameters for the project case are adjusted at the AADT level to equalise the traffic volumes for the project case with the base case.

Appendix E. Peak Traffic Parameters for Freight Growth of 5%

Base Case	Annual Car Traffic Growth – 2%				Annual Car Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	807	900	1,292	1,439	807	900	1,534	1,709
Number of vehicles that have left the network, Vehicle Class HGV	125	137	312	343	125	137	312	343
Total Distance Travelled [km], Vehicle Class Car	25,993	28,965	41,590	46,344	25,993	28,965	49,388	55,034
Total Distance Travelled [km], Vehicle Class HGV	4,013	4,417	10,032	11,043	4,013	4,417	10,032	11,043
Total travel time [h], Vehicle Class Car	348	399	634	716	348	399	762	851
Total travel time [h], Vehicle Class HGV	59	66	159	176	59	66	160	176
Average speed [km/h], Vehicle Class Car	75	73	66	65	75	73	65	65
Average speed [km/h], Vehicle Class HGV	68	67	63	63	68	67	63	63

Project Case ¹²	Annual Car Traffic Growth – 2%				Annual Car Traffic Growth – 3%			
	2013 AM	2013 PM	2043 AM	2043 PM	2013 AM	2013 PM	2043 AM	2043 PM
Number of vehicles that have left the network, Vehicle Class Car	802	896	1,283	1,434	802	896	1,523	1,703
Number of vehicles that have left the network, Vehicle Class HGV	124	137	310	342	124	137	310	342
Total Distance Travelled [km], Vehicle Class Car	26,294	29,394	42,071	47,031	26,294	29,394	49,959	55,849
Total Distance Travelled [km], Vehicle Class HGV	4,063	4,489	10,156	11,222	4,063	4,489	10,156	11,222
Total travel time [h], Vehicle Class Car	263	295	458	521	263	295	560	639
Total travel time [h], Vehicle Class HGV	48	53	125	140	48	53	127	142
Average speed [km/h], Vehicle Class Car	100	100	92	90	100	100	89	87
Average speed [km/h], Vehicle Class HGV	85	85	81	80	85	85	80	79

¹² The volume of vehicles is marginally different between the base and project options in the raw traffic results due modelling idiosyncrasies. The traffic parameters for the project case are adjusted at the AADT level to equalise the traffic volumes for the project case with the base case.

Appendix F. Historical Crash Data

Suburb / Road	Distance (m)	Direction	Location	Description	F	I	P	Excluded
Jeir Creek / Barton Hwy	-	-	Capricorn	Off Rd Right		2		
Jeir Creek / Barton Hwy	10	N	Capricorn	Rear end		1		
Jeir Creek / Barton Hwy	-	-	Casuarina	Off Left			1	
Jeir Creek / Barton Hwy	500	S	Casuarina	Off Left			1	
Jeir Creek / Barton Hwy	360	N	Gooda Creek	Off Rd Right		2		
Jeir Creek / Barton Hwy	200	S	Gooda Creek	Struck animal			1	
Jeir Creek / Barton Hwy	1,000	S	Gooda Creek	Struck animal		1		
Jeir Creek / Barton Hwy	1,000	S	Gooda Creek	Rear end		2		
Jeir Creek / Barton Hwy	-	-	Jeir Creek Bridge	Off Rd Right			1	
Jeir Creek / Barton Hwy	10	N	Kaveney's	Struck animal		1		
Jeir Creek / Barton Hwy	2,000	N	Kaveney's	Struck animal			1	
Jeir Creek / Barton Hwy	2,000	N	Kaveney's	Struck animal		1		
Jeir Creek / Barton Hwy	2,000	N	Kaveney's	Object on road			1	
Jeir Creek / Barton Hwy	200	N	Mundays	Struck animal			1	
Jeir Creek / Barton Hwy	800	N	Mundays	Struck animal			1	
Jeir Creek / Barton Hwy	800	N	Mundays	Off Rd Right			1	
Jeir Creek / Barton Hwy	1,000	N	Mundays	Off Rd Right			1	
Jeir Creek / Barton Hwy	270	S	Mundays	Right through		2		
Jeir Creek / Barton Hwy	1,000	S	Mundays	Off Left		2		
Jeir Creek / Barton Hwy	1,300	S	Mundays	Rear end			1	
Jeir Creek / Barton Hwy	15,000	S	Murrumbateman	Struck animal			1	
Jeir Creek / Barton Hwy	10	N	Number 2309	Off Left			1	
Jeir Creek / Barton Hwy	150	S	Vallencia	Off Left			1	
Jeir Creek / Barton Hwy	310	S	Vallencia	Off Left			1	
Jeir Creek / Barton Hwy	3,000	S	Vallencia	Off Rd Right		2		
Jeir Station / Barton Hwy	1,050	S	Casuarina	Off Rd Right			1	Yes
Murrumbateman / Barton Hwy	800	N	Capricorn	Struck animal			1	
Murrumbateman / Barton Hwy	55	N	Doonkoona	Off Rd Right			1	
Murrumbateman / Barton Hwy	-	-	Euroka	Struck animal			1	
Murrumbateman / Barton Hwy	-	-	Euroka	Head on			1	
Murrumbateman / Barton Hwy	-	-	Euroka	Rear end			1	
Murrumbateman / Barton Hwy	40	N	Euroka	Rear end			1	
Murrumbateman / Barton Hwy	200	N	Euroka	Head on		2		
Murrumbateman / Barton Hwy	15	S	Euroka	Rear end		1		
Murrumbateman / Barton Hwy	400	N	Gooda Creek	Off Rd Right		1		
Murrumbateman / Barton Hwy	500	N	Gooda Creek	Off Rd Right			1	
Murrumbateman / Barton Hwy	1,745	N	Gooda Creek	Off Rd Right			1	
Murrumbateman / Barton Hwy	200	S	Gooda Creek	Rear end		1		

Suburb / Road	Distance (m)	Direction	Location	Description	F	I	P	Excluded
Murrumbateman / Barton Hwy	600	S	Gooda Creek	Off Rd Right		1		
Murrumbateman / Barton Hwy	1,000	S	Gooda Creek	Off Rd Right		1		
Murrumbateman / Barton Hwy	50	N	Gooda Creek	Struck animal			1	
Murrumbateman / Barton Hwy	50	N	Gooda Creek	Struck animal			1	
Murrumbateman / Barton Hwy	50	N	Gounyan	Off Left		1		Yes
Murrumbateman / Barton Hwy	300	N	Gounyan	Rear end			1	Yes
Murrumbateman / Barton Hwy	850	N	Gounyan	Off Rd Right		1		Yes
Murrumbateman / Barton Hwy	1,490	N	Gounyan	Off Left			1	Yes
Murrumbateman / Barton Hwy	1,600	N	Gounyan	Off Left		1		Yes
Murrumbateman / Barton Hwy	600	S	Gounyan	Head on		4		Yes
Murrumbateman / Barton Hwy	500	N	Gounyan	Off Left			1	Yes
Murrumbateman / Barton Hwy	1,370	N	Gounyan	Off Rd Right			1	Yes
Murrumbateman / Barton Hwy	50	N	Hercules	Rear end			1	
Murrumbateman / Barton Hwy	50	N	Hercules	Rear end		1		
Murrumbateman / Barton Hwy	10	S	Hercules	Pkd Veh Runaway			1	
Murrumbateman / Barton Hwy	20	S	Hercules	Rear end			1	
Murrumbateman / Barton Hwy	1,800	N	Hillview	Off Left		1		
Murrumbateman / Barton Hwy	700	N	Jeir Ck	Cutting in			1	
Murrumbateman / Barton Hwy	500	S	Jeir Ck	Off Left			1	Yes
Murrumbateman / Barton Hwy	400	S	Long Rail Gull	Struck animal			1	Yes
Murrumbateman / Barton Hwy	900	S	Long Rail Gull	Off Rd Right		1		Yes
Murrumbateman / Barton Hwy	200	N	McClungs	Off Left		1		
Murrumbateman / Barton Hwy	-	-	McIntosh	Cross Traffic		1		Yes
Murrumbateman / Barton Hwy	31	N	McIntosh	Head on		1		Yes
Murrumbateman / Barton Hwy	45	N	McIntosh	Accident			1	Yes
Murrumbateman / Barton Hwy	50	N	McIntosh	Rear end			1	Yes
Murrumbateman / Barton Hwy	200	N	McIntosh	Off Left			1	Yes
Murrumbateman / Barton Hwy	700	N	McIntosh	Off Rd Right			1	
Murrumbateman / Barton Hwy	100	S	McIntosh	Head on		1		Yes
Murrumbateman / Barton Hwy	200	S	McIntosh	Off Rd Right		2		Yes
Murrumbateman / Barton Hwy	350	S	McIntosh	Off Rd Right		1		Yes
Murrumbateman / Barton Hwy	520	S	McIntosh	Overtaking		2		Yes
Murrumbateman / Barton Hwy	360	N	Mundays	Rear end			1	
Murrumbateman / Barton Hwy	500	N	Mundays	Rear end	1	1		
Murrumbateman / Barton Hwy	1,000	S	Mundays	Head on		5		
Murrumbateman / Barton Hwy	200	N	Murrumbateman	Off Rd Right			1	
Murrumbateman / Barton Hwy	5	S	Murrumbateman	Rear end			1	Yes
Murrumbateman / Barton Hwy	150	S	Murrumbateman	Rear end		2		Yes
Murrumbateman / Barton Hwy	200	S	Murrumbateman	Off Left			1	Yes

Suburb / Road	Distance (m)	Direction	Location	Description	F	I	P	Excluded
Murrumbateman / Barton Hwy	250	S	Murrumbateman	Off Left		1		Yes
Murrumbateman / Barton Hwy	500	S	Murrumbateman	Off Left			1	Yes
Murrumbateman / Barton Hwy	565	S	Murrumbateman	Off Left		1		Yes
Murrumbateman / Barton Hwy	600	S	Murrumbateman	Off Rd Right		1		Yes
Murrumbateman / Barton Hwy	650	S	Murrumbateman	Off Left			1	Yes
Murrumbateman / Barton Hwy	1,000	S	Murrumbateman	Object on road			1	
Murrumbateman / Barton Hwy	1,400	S	Murrumbateman	Head on	1	2		
Murrumbateman / Barton Hwy	2,000	S	Murrumbateman	Rear end		1		
Murrumbateman / Barton Hwy	10	N	South	Rear end			1	
Murrumbateman / Barton Hwy	200	S	South	Off Left			1	Yes
Murrumbateman / Barton Hwy	680	S	South	Ped walk	1			Yes
Murrumbateman / Barton Hwy	700	S	South	Off Left			1	Yes
Murrumbateman / Barton Hwy	100	N	Vallencia	Rear end			1	
Murrumbateman / Barton Hwy	20	N	Vallencia	Off Rd Right		1		
Murrumbateman / Barton Hwy	300	S	Vallencia	Off Rd Right	1	1		
Murrumbateman / Barton Hwy	1,000	S	Vallencia	Off Left			1	
Murrumbateman / Barton Hwy	4,000	S	Yass	Rear end		1		
Murrumbateman / Barton Hwy	7,300	S	Yass	Off Left			1	Yes
Murrumbateman / Barton Hwy	5,000	S	Yass	Off Rd Right		4		Yes
Murrumbateman / Barton Hwy	6,150	S	Yass	Off Left		2		Yes
Murrumbateman / Hillview Dr	5	E	Barton	Rear end		1		
Yass / Barton Hwy	10	N	Murrumbateman	Off left		1		Yes
Yass / Barton Hwy	3,000	S	Yass	Off Left		3		
Yass / Barton Hwy	4,000	S	Yass	Off Rd Right			1	
Hall/ Barton Hwy	3,000	N	ACT Border	Head on		3		
Hall/ Barton Hwy	3,400	N	ACT Border	Off Left		1		
Hall/ Barton Hwy	100	S	Boundary	Off Left			1	
Hall/ Barton Hwy	-	-	Church	Off Left			1	
Hall/ Barton Hwy	175	S	Church	Accident		2		
Hall/ Barton Hwy	200	S	Church	Off left			1	
Hall/ Barton Hwy	-	-	Nanima	Rear end			1	
Hall/ Barton Hwy	800	N	Nanima	Off Left			1	
Hall/ Barton Hwy	980	N	Nanima	Head on		4		
Hall/ Barton Hwy	1,000	S	Nanima	Rear end			1	
Hall/ Barton Hwy	1,000	S	Nanima	Rear end		1		
Hall/ Barton Hwy	30	N	Spring Range	Off Rd Right			1	
Hall/ Barton Hwy	1,170	N	Spring Range	Off Rd Right	1	1		
Hall/ Nanima Rd	5	E	Barton	Rear end		1		
Sutton/ Barton Hwy	1,000	S	Nanima	Head on			1	
Sutton/ Barton Hwy	350	N	Spring Range	Off Rd Right			1	

Appendix G. Whole of Life Cash Flows

2% Traffic Growth Construction by Year 5		Costs			Benefits					Net Benefits
Project Year	Fiscal Year End	Capital cost	Maintenance Costs	Total net costs	Travel Time Savings	VOC Savings	External Savings	Safety Benefits	Total benefits	
		\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	
1	30-Jun-14	-	-	-	-	-	-	-	-	-
2	30-Jun-15	-	-	-	-	-	-	-	-	-
3	30-Jun-16	\$ 225.16	-	\$ 225.16	-	-	-	-	-	-\$ 225.16
4	30-Jun-17	\$ 476.42	-	\$ 476.42	-	-	-	-	-	-\$ 476.42
5	30-Jun-18	\$ 218.11	-	\$ 218.11	-	-	-	-	-	-\$ 218.11
6	30-Jun-19	-	-\$ 1.46	-\$ 1.46	\$ 21.42	\$ 2.08	-\$ 0.36	\$ 3.29	\$ 26.43	\$ 27.89
7	30-Jun-20	-	-\$ 1.46	-\$ 1.46	\$ 22.20	\$ 2.24	-\$ 0.37	\$ 3.35	\$ 27.43	\$ 28.89
8	30-Jun-21	-	-\$ 1.46	-\$ 1.46	\$ 23.00	\$ 2.41	-\$ 0.37	\$ 3.41	\$ 28.44	\$ 29.90
9	30-Jun-22	-	-\$ 1.46	-\$ 1.46	\$ 23.80	\$ 2.58	-\$ 0.38	\$ 3.47	\$ 29.47	\$ 30.93
10	30-Jun-23	-	-\$ 1.46	-\$ 1.46	\$ 24.62	\$ 2.76	-\$ 0.39	\$ 3.53	\$ 30.52	\$ 31.98
11	30-Jun-24	-	-\$ 1.46	-\$ 1.46	\$ 25.45	\$ 2.94	-\$ 0.39	\$ 3.59	\$ 31.58	\$ 33.04
12	30-Jun-25	-	-\$ 1.46	-\$ 1.46	\$ 26.29	\$ 3.12	-\$ 0.40	\$ 3.65	\$ 32.66	\$ 34.12
13	30-Jun-26	-	-\$ 1.46	-\$ 1.46	\$ 27.14	\$ 3.31	-\$ 0.41	\$ 3.71	\$ 33.76	\$ 35.22
14	30-Jun-27	-	-\$ 1.46	-\$ 1.46	\$ 28.01	\$ 3.51	-\$ 0.41	\$ 3.77	\$ 34.87	\$ 36.33
15	30-Jun-28	-	-\$ 1.46	-\$ 1.46	\$ 28.89	\$ 3.70	-\$ 0.42	\$ 3.82	\$ 36.00	\$ 37.46
16	30-Jun-29	-	-\$ 1.46	-\$ 1.46	\$ 29.79	\$ 3.91	-\$ 0.43	\$ 3.88	\$ 37.15	\$ 38.61
17	30-Jun-30	-	-\$ 1.46	-\$ 1.46	\$ 30.70	\$ 4.12	-\$ 0.43	\$ 3.94	\$ 38.32	\$ 39.78
18	30-Jun-31	-	-\$ 1.46	-\$ 1.46	\$ 31.62	\$ 4.33	-\$ 0.44	\$ 4.00	\$ 39.51	\$ 40.97
19	30-Jun-32	-	-\$ 1.46	-\$ 1.46	\$ 32.56	\$ 4.54	-\$ 0.44	\$ 4.06	\$ 40.71	\$ 42.17
20	30-Jun-33	-	-\$ 1.46	-\$ 1.46	\$ 33.51	\$ 4.76	-\$ 0.45	\$ 4.12	\$ 41.94	\$ 43.40
21	30-Jun-34	-	-\$ 1.46	-\$ 1.46	\$ 34.47	\$ 4.99	-\$ 0.46	\$ 4.18	\$ 43.18	\$ 44.64
22	30-Jun-35	-	-\$ 1.46	-\$ 1.46	\$ 35.45	\$ 5.22	-\$ 0.46	\$ 4.24	\$ 44.44	\$ 45.90
23	30-Jun-36	-	-\$ 1.46	-\$ 1.46	\$ 36.44	\$ 5.45	-\$ 0.47	\$ 4.29	\$ 45.72	\$ 47.18
24	30-Jun-37	-	-\$ 1.46	-\$ 1.46	\$ 37.45	\$ 5.69	-\$ 0.48	\$ 4.35	\$ 47.02	\$ 48.48
25	30-Jun-38	-	-\$ 1.46	-\$ 1.46	\$ 38.47	\$ 5.93	-\$ 0.48	\$ 4.41	\$ 48.34	\$ 49.80
26	30-Jun-39	-	-\$ 1.46	-\$ 1.46	\$ 39.51	\$ 6.18	-\$ 0.49	\$ 4.47	\$ 49.68	\$ 51.14
27	30-Jun-40	-	-\$ 1.46	-\$ 1.46	\$ 40.57	\$ 6.43	-\$ 0.50	\$ 4.53	\$ 51.04	\$ 52.50
28	30-Jun-41	-	-\$ 1.46	-\$ 1.46	\$ 41.64	\$ 6.69	-\$ 0.50	\$ 4.59	\$ 52.41	\$ 53.87
29	30-Jun-42	-	-\$ 1.46	-\$ 1.46	\$ 42.73	\$ 6.95	-\$ 0.51	\$ 4.65	\$ 53.81	\$ 55.27
30	30-Jun-43	-	-\$ 1.46	-\$ 1.46	\$ 43.83	\$ 7.21	-\$ 0.52	\$ 4.71	\$ 55.23	\$ 56.69
31	30-Jun-44	-	-\$ 1.46	-\$ 1.46	\$ 44.95	\$ 7.48	-\$ 0.52	\$ 4.77	\$ 56.67	\$ 58.13
32	30-Jun-45	-	-\$ 1.46	-\$ 1.46	\$ 46.08	\$ 7.76	-\$ 0.53	\$ 4.82	\$ 58.14	\$ 59.60
33	30-Jun-46	-	-	-	-	-	-	-	-	-
34	30-Jun-47	-	-	-	-	-	-	-	-	-
35	30-Jun-48	-	-	-	-	-	-	-	-	-
36	30-Jun-49	-	-	-	-	-	-	-	-	-
37	30-Jun-50	-	-	-	-	-	-	-	-	-
38	30-Jun-51	-	-	-	-	-	-	-	-	-
39	30-Jun-52	-	-	-	-	-	-	-	-	-
40	30-Jun-53	-	-	-	-	-	-	-	-	-
41	30-Jun-54	-	-	-	-	-	-	-	-	-
42	30-Jun-55	-	-	-	-	-	-	-	-	-
43	30-Jun-56	-	-	-	-	-	-	-	-	-
44	30-Jun-57	-	-	-	-	-	-	-	-	-

2% Traffic Growth Construction by Year 5		Costs			Benefits					Net Benefits
Project Year	Fiscal Year End	Capital cost	Maintenance Costs	Total net costs	Travel Time Savings	VOC Savings	External Savings	Safety Benefits	Total benefits	
		\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	
45	30-Jun-58	-	-	-	-	-	-	-	-	-
46	30-Jun-59	-	-	-	-	-	-	-	-	-
47	30-Jun-60	-	-	-	-	-	-	-	-	-
48	30-Jun-61	-	-	-	-	-	-	-	-	-
49	30-Jun-62	-	-	-	-	-	-	-	-	-
50	30-Jun-63	-	-	-	-	-	-	-	-	-
51	30-Jun-64	-	-	-	-	-	-	-	-	-
52	30-Jun-65	-	-	-	-	-	-	-	-	-
Total Real Dollars (not discounted)		\$ 919.69	-\$ 39.42	\$ 880.27	\$ 890.58	\$ 126.30	-\$ 12.01	\$ 109.61	\$ 1,114.47	\$ 234.21
Discounted Total 7.0%		\$ 751.96	-\$ 13.35	\$ 738.61	\$ 268.33	\$ 35.12	-\$ 3.84	\$ 35.03	\$ 334.65	-\$ 403.96
Discounted Total 4.0%		\$ 818.15	-\$ 20.38	\$ 797.77	\$ 429.77	\$ 58.24	-\$ 6.00	\$ 54.75	\$ 536.75	-\$ 261.02
Discounted Total 10.0%		\$ 693.00	-\$ 9.21	\$ 683.78	\$ 177.38	\$ 22.46	-\$ 2.59	\$ 23.67	\$ 220.93	-\$ 462.86

2% Traffic Growth Construction by Year 15		Costs			Benefits					Net Benefits
Project Year	Fiscal Year End	Capital cost	Maintenance Costs	Total net costs	Travel Time Savings	VOC Savings	External Savings	Safety Benefits	Total benefits	
		\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	
1	30-Jun-14	-	-	-	-	-	-	-	-	-
2	30-Jun-15	-	-	-	-	-	-	-	-	-
3	30-Jun-16	-	-	-	-	-	-	-	-	-
4	30-Jun-17	-	-	-	-	-	-	-	-	-
5	30-Jun-18	-	-	-	-	-	-	-	-	-
6	30-Jun-19	-	-	-	-	-	-	-	-	-
7	30-Jun-20	-	-	-	-	-	-	-	-	-
8	30-Jun-21	-	-	-	-	-	-	-	-	-
9	30-Jun-22	-	-	-	-	-	-	-	-	-
10	30-Jun-23	-	-	-	-	-	-	-	-	-
11	30-Jun-24	-	-	-	-	-	-	-	-	-
12	30-Jun-25	-	-	-	-	-	-	-	-	-
13	30-Jun-26	\$ 236.38	-	\$ 236.38	-	-	-	-	-	-\$ 236.38
14	30-Jun-27	\$ 500.18	-	\$ 500.18	-	-	-	-	-	-\$ 500.18
15	30-Jun-28	\$ 228.99	-	\$ 228.99	-	-	-	-	-	-\$ 228.99
16	30-Jun-29	-	-\$ 1.46	-\$ 1.46	\$ 29.79	\$ 3.91	-\$ 0.43	\$ 3.88	\$ 37.15	\$ 38.61
17	30-Jun-30	-	-\$ 1.46	-\$ 1.46	\$ 30.70	\$ 4.12	-\$ 0.43	\$ 3.94	\$ 38.32	\$ 39.78
18	30-Jun-31	-	-\$ 1.46	-\$ 1.46	\$ 31.62	\$ 4.33	-\$ 0.44	\$ 4.00	\$ 39.51	\$ 40.97
19	30-Jun-32	-	-\$ 1.46	-\$ 1.46	\$ 32.56	\$ 4.54	-\$ 0.44	\$ 4.06	\$ 40.71	\$ 42.17
20	30-Jun-33	-	-\$ 1.46	-\$ 1.46	\$ 33.51	\$ 4.76	-\$ 0.45	\$ 4.12	\$ 41.94	\$ 43.40
21	30-Jun-34	-	-\$ 1.46	-\$ 1.46	\$ 34.47	\$ 4.99	-\$ 0.46	\$ 4.18	\$ 43.18	\$ 44.64
22	30-Jun-35	-	-\$ 1.46	-\$ 1.46	\$ 35.45	\$ 5.22	-\$ 0.46	\$ 4.24	\$ 44.44	\$ 45.90
23	30-Jun-36	-	-\$ 1.46	-\$ 1.46	\$ 36.44	\$ 5.45	-\$ 0.47	\$ 4.29	\$ 45.72	\$ 47.18
24	30-Jun-37	-	-\$ 1.46	-\$ 1.46	\$ 37.45	\$ 5.69	-\$ 0.48	\$ 4.35	\$ 47.02	\$ 48.48
25	30-Jun-38	-	-\$ 1.46	-\$ 1.46	\$ 38.47	\$ 5.93	-\$ 0.48	\$ 4.41	\$ 48.34	\$ 49.80
26	30-Jun-39	-	-\$ 1.46	-\$ 1.46	\$ 39.51	\$ 6.18	-\$ 0.49	\$ 4.47	\$ 49.68	\$ 51.14
27	30-Jun-40	-	-\$ 1.46	-\$ 1.46	\$ 40.57	\$ 6.43	-\$ 0.50	\$ 4.53	\$ 51.04	\$ 52.50
28	30-Jun-41	-	-\$ 1.46	-\$ 1.46	\$ 41.64	\$ 6.69	-\$ 0.50	\$ 4.59	\$ 52.41	\$ 53.87
29	30-Jun-42	-	-\$ 1.46	-\$ 1.46	\$ 42.73	\$ 6.95	-\$ 0.51	\$ 4.65	\$ 53.81	\$ 55.27
30	30-Jun-43	-	-\$ 1.46	-\$ 1.46	\$ 43.83	\$ 7.21	-\$ 0.52	\$ 4.71	\$ 55.23	\$ 56.69
31	30-Jun-44	-	-\$ 1.46	-\$ 1.46	\$ 44.95	\$ 7.48	-\$ 0.52	\$ 4.77	\$ 56.67	\$ 58.13
32	30-Jun-45	-	-\$ 1.46	-\$ 1.46	\$ 46.08	\$ 7.76	-\$ 0.53	\$ 4.82	\$ 58.14	\$ 59.60
33	30-Jun-46	-	-\$ 1.46	-\$ 1.46	\$ 47.23	\$ 8.04	-\$ 0.54	\$ 4.88	\$ 59.62	\$ 61.08
34	30-Jun-47	-	-\$ 1.46	-\$ 1.46	\$ 48.40	\$ 8.32	-\$ 0.54	\$ 4.94	\$ 61.12	\$ 62.58
35	30-Jun-48	-	-\$ 1.46	-\$ 1.46	\$ 49.59	\$ 8.61	-\$ 0.55	\$ 5.00	\$ 62.65	\$ 64.11
36	30-Jun-49	-	-\$ 1.46	-\$ 1.46	\$ 50.80	\$ 8.90	-\$ 0.55	\$ 5.06	\$ 64.20	\$ 65.66
37	30-Jun-50	-	-\$ 1.46	-\$ 1.46	\$ 52.02	\$ 9.19	-\$ 0.56	\$ 5.12	\$ 65.77	\$ 67.23
38	30-Jun-51	-	-\$ 1.46	-\$ 1.46	\$ 53.26	\$ 9.49	-\$ 0.57	\$ 5.18	\$ 67.36	\$ 68.82
39	30-Jun-52	-	-\$ 1.46	-\$ 1.46	\$ 54.52	\$ 9.80	-\$ 0.57	\$ 5.24	\$ 68.98	\$ 70.44
40	30-Jun-53	-	-\$ 1.46	-\$ 1.46	\$ 55.79	\$ 10.11	-\$ 0.58	\$ 5.30	\$ 70.62	\$ 72.08
41	30-Jun-54	-	-\$ 1.46	-\$ 1.46	\$ 57.09	\$ 10.42	-\$ 0.59	\$ 5.35	\$ 72.28	\$ 73.74
42	30-Jun-55	-	-\$ 1.46	-\$ 1.46	\$ 58.40	\$ 10.74	-\$ 0.59	\$ 5.41	\$ 73.96	\$ 75.42
43	30-Jun-56	-	-	-	-	-	-	-	-	-
44	30-Jun-57	-	-	-	-	-	-	-	-	-
45	30-Jun-58	-	-	-	-	-	-	-	-	-
46	30-Jun-59	-	-	-	-	-	-	-	-	-
47	30-Jun-60	-	-	-	-	-	-	-	-	-

2% Traffic Growth Construction by Year 15		Costs			Benefits					Net Benefits
Project Year	Fiscal Year End	Capital cost	Maintenance Costs	Total net costs	Travel Time Savings	VOC Savings	External Savings	Safety Benefits	Total benefits	
		\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	
48	30-Jun-61	-	-	-	-	-	-	-	-	-
49	30-Jun-62	-	-	-	-	-	-	-	-	-
50	30-Jun-63	-	-	-	-	-	-	-	-	-
51	30-Jun-64	-	-	-	-	-	-	-	-	-
52	30-Jun-65	-	-	-	-	-	-	-	-	-
Total Real Dollars (not discounted)		\$ 965.55	-\$ 39.42	\$ 926.13	\$ 1,166.86	\$ 191.25	-\$ 13.75	\$ 125.50	\$ 1,469.86	\$ 543.73
Discounted Total 7.0%		\$ 401.32	-\$ 6.79	\$ 394.53	\$ 181.26	\$ 28.24	-\$ 2.25	\$ 20.54	\$ 227.79	-\$ 166.74
Discounted Total 4.0%		\$ 580.27	-\$ 13.77	\$ 566.51	\$ 383.51	\$ 61.06	-\$ 4.66	\$ 42.53	\$ 482.43	-\$ 84.07
Discounted Total 10.0%		\$ 280.50	-\$ 3.55	\$ 276.95	\$ 91.38	\$ 13.95	-\$ 1.16	\$ 10.56	\$ 114.73	-\$ 162.22

2% Traffic Growth Construction by Year 25		Costs			Benefits					Net Benefits
Project Year	Fiscal Year End	Capital cost	Maintenance Costs	Total net costs	Travel Time Savings	VOC Savings	External Savings	Safety Benefits	Total benefits	
		\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	
1	30-Jun-14	-	-	-	-	-	-	-	-	-
2	30-Jun-15	-	-	-	-	-	-	-	-	-
3	30-Jun-16	-	-	-	-	-	-	-	-	-
4	30-Jun-17	-	-	-	-	-	-	-	-	-
5	30-Jun-18	-	-	-	-	-	-	-	-	-
6	30-Jun-19	-	-	-	-	-	-	-	-	-
7	30-Jun-20	-	-	-	-	-	-	-	-	-
8	30-Jun-21	-	-	-	-	-	-	-	-	-
9	30-Jun-22	-	-	-	-	-	-	-	-	-
10	30-Jun-23	-	-	-	-	-	-	-	-	-
11	30-Jun-24	-	-	-	-	-	-	-	-	-
12	30-Jun-25	-	-	-	-	-	-	-	-	-
13	30-Jun-26	-	-	-	-	-	-	-	-	-
14	30-Jun-27	-	-	-	-	-	-	-	-	-
15	30-Jun-28	-	-	-	-	-	-	-	-	-
16	30-Jun-29	-	-	-	-	-	-	-	-	-
17	30-Jun-30	-	-	-	-	-	-	-	-	-
18	30-Jun-31	-	-	-	-	-	-	-	-	-
19	30-Jun-32	-	-	-	-	-	-	-	-	-
20	30-Jun-33	-	-	-	-	-	-	-	-	-
21	30-Jun-34	-	-	-	-	-	-	-	-	-
22	30-Jun-35	-	-	-	-	-	-	-	-	-
23	30-Jun-36	\$ 248.17	-	\$ 248.17	-	-	-	-	-	-\$ 248.17
24	30-Jun-37	\$ 525.12	-	\$ 525.12	-	-	-	-	-	-\$ 525.12
25	30-Jun-38	\$ 240.41	-	\$ 240.41	-	-	-	-	-	-\$ 240.41
26	30-Jun-39	-	-\$ 1.46	-\$ 1.46	\$ 39.51	\$ 6.18	-\$ 0.49	\$ 4.47	\$ 49.68	\$ 51.14
27	30-Jun-40	-	-\$ 1.46	-\$ 1.46	\$ 40.57	\$ 6.43	-\$ 0.50	\$ 4.53	\$ 51.04	\$ 52.50
28	30-Jun-41	-	-\$ 1.46	-\$ 1.46	\$ 41.64	\$ 6.69	-\$ 0.50	\$ 4.59	\$ 52.41	\$ 53.87
29	30-Jun-42	-	-\$ 1.46	-\$ 1.46	\$ 42.73	\$ 6.95	-\$ 0.51	\$ 4.65	\$ 53.81	\$ 55.27
30	30-Jun-43	-	-\$ 1.46	-\$ 1.46	\$ 43.83	\$ 7.21	-\$ 0.52	\$ 4.71	\$ 55.23	\$ 56.69
31	30-Jun-44	-	-\$ 1.46	-\$ 1.46	\$ 44.95	\$ 7.48	-\$ 0.52	\$ 4.77	\$ 56.67	\$ 58.13
32	30-Jun-45	-	-\$ 1.46	-\$ 1.46	\$ 46.08	\$ 7.76	-\$ 0.53	\$ 4.82	\$ 58.14	\$ 59.60
33	30-Jun-46	-	-\$ 1.46	-\$ 1.46	\$ 47.23	\$ 8.04	-\$ 0.54	\$ 4.88	\$ 59.62	\$ 61.08
34	30-Jun-47	-	-\$ 1.46	-\$ 1.46	\$ 48.40	\$ 8.32	-\$ 0.54	\$ 4.94	\$ 61.12	\$ 62.58
35	30-Jun-48	-	-\$ 1.46	-\$ 1.46	\$ 49.59	\$ 8.61	-\$ 0.55	\$ 5.00	\$ 62.65	\$ 64.11
36	30-Jun-49	-	-\$ 1.46	-\$ 1.46	\$ 50.80	\$ 8.90	-\$ 0.55	\$ 5.06	\$ 64.20	\$ 65.66
37	30-Jun-50	-	-\$ 1.46	-\$ 1.46	\$ 52.02	\$ 9.19	-\$ 0.56	\$ 5.12	\$ 65.77	\$ 67.23
38	30-Jun-51	-	-\$ 1.46	-\$ 1.46	\$ 53.26	\$ 9.49	-\$ 0.57	\$ 5.18	\$ 67.36	\$ 68.82
39	30-Jun-52	-	-\$ 1.46	-\$ 1.46	\$ 54.52	\$ 9.80	-\$ 0.57	\$ 5.24	\$ 68.98	\$ 70.44
40	30-Jun-53	-	-\$ 1.46	-\$ 1.46	\$ 55.79	\$ 10.11	-\$ 0.58	\$ 5.30	\$ 70.62	\$ 72.08
41	30-Jun-54	-	-\$ 1.46	-\$ 1.46	\$ 57.09	\$ 10.42	-\$ 0.59	\$ 5.35	\$ 72.28	\$ 73.74
42	30-Jun-55	-	-\$ 1.46	-\$ 1.46	\$ 58.40	\$ 10.74	-\$ 0.59	\$ 5.41	\$ 73.96	\$ 75.42
43	30-Jun-56	-	-\$ 1.46	-\$ 1.46	\$ 59.74	\$ 11.06	-\$ 0.60	\$ 5.47	\$ 75.67	\$ 77.13
44	30-Jun-57	-	-\$ 1.46	-\$ 1.46	\$ 61.09	\$ 11.39	-\$ 0.61	\$ 5.53	\$ 77.40	\$ 78.86
45	30-Jun-58	-	-\$ 1.46	-\$ 1.46	\$ 62.46	\$ 11.72	-\$ 0.61	\$ 5.59	\$ 79.16	\$ 80.62
46	30-Jun-59	-	-\$ 1.46	-\$ 1.46	\$ 63.86	\$ 12.05	-\$ 0.62	\$ 5.65	\$ 80.94	\$ 82.40
47	30-Jun-60	-	-\$ 1.46	-\$ 1.46	\$ 65.27	\$ 12.39	-\$ 0.63	\$ 5.71	\$ 82.75	\$ 84.21

2% Traffic Growth Construction by Year 25		Costs			Benefits					Net Benefits
Project Year	Fiscal Year End	Capital cost	Maintenance Costs	Total net costs	Travel Time Savings	VOC Savings	External Savings	Safety Benefits	Total benefits	
		\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	
48	30-Jun-61	-	-\$ 1.46	-\$ 1.46	\$ 66.71	\$ 12.74	-\$ 0.63	\$ 5.77	\$ 84.58	\$ 86.04
49	30-Jun-62	-	-\$ 1.46	-\$ 1.46	\$ 68.16	\$ 13.09	-\$ 0.64	\$ 5.82	\$ 86.44	\$ 87.90
50	30-Jun-63	-	-\$ 1.46	-\$ 1.46	\$ 69.64	\$ 13.44	-\$ 0.64	\$ 5.88	\$ 88.32	\$ 89.78
51	30-Jun-64	-	-\$ 1.46	-\$ 1.46	\$ 71.14	\$ 13.80	-\$ 0.65	\$ 5.94	\$ 90.23	\$ 91.69
52	30-Jun-65	-	-\$ 1.46	-\$ 1.46	\$ 72.65	\$ 14.16	-\$ 0.66	\$ 6.00	\$ 92.16	\$ 93.62
Total Real Dollars (not discounted)		\$ 1,013.70	-\$ 39.42	\$ 974.28	\$ 1,487.13	\$ 268.16	-\$ 15.49	\$ 141.38	\$ 1,881.17	\$ 906.90
Discounted Total 7.0%		\$ 214.18	-\$ 3.45	\$ 210.73	\$ 118.59	\$ 20.68	-\$ 1.30	\$ 11.83	\$ 149.81	-\$ 60.93
Discounted Total 4.0%		\$ 411.56	-\$ 9.30	\$ 402.26	\$ 332.08	\$ 58.73	-\$ 3.56	\$ 32.48	\$ 419.73	\$ 17.48
Discounted Total 10.0%		\$ 113.54	-\$ 1.37	\$ 112.17	\$ 45.51	\$ 7.83	-\$ 0.51	\$ 4.62	\$ 57.46	-\$ 54.71